JOURNAL OF THE EXPERIMENTAL ANALYSIS OF BEHAVIOR 1999, **72,** 429–432 NUMBER 3 (NOVEMBER)

A REVIEW OF GERALDINE JONÇICH'S THE SANE POSITIVIST: A BIOGRAPHY OF EDWARD L. THORNDIKE

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This book review, unfinished at the author's death, examines in historical context Thorndike's law of effect, his *Animal Intelligence* monograph of 1898, and related works on learning and behavior.

Key words: E. L. Thorndike, *Animal Intelligence* monograph, law of effect, learning theories, associationism, impulse, emission

Very little in the published histories of psychology prepares us for the giant that emerges from the pages of Geraldine Jonçich's *The Sane Positivist: A Biography of Edward L. Thorndike* (1968). In his history of experimental psychology, Boring (1950) devotes two pages to the man, sandwiched in among other notes on ''Columbia's Functional Psychology.'' But Thorndike himself had been almost equally laconic in his autobiographical sketch in Murchison's (1936) *History of Psychology in Autobiography III.* Out of his busy schedule, he managed to free enough time to write seven pages on his own life. Thirteen years later, in the year of his death, he provided an additional two pages, concluding with ''It should perhaps be noted that I have spent much time and thought on educational science proper, as shown in various monographs and articles, most of them factual.'' Jonçich remarks: ''He told us less of himself than is necessary, certainly much less than we would wish to know'' (''One's first duty, then, is modesty,'' Thorndike had observed in *The Human Nature Club* in 1901).

Jonçich does not share this stinginess. In 591 pages (plus a 21-page ''essay on sources'') she examines the 75 years between 1874 and 1949, and the man whose boundless energies filled those years and left a more profound mark on psychology and education than many of us are aware. As B. F. Skinner remarked in a letter to Thorndike on February 7, 1939, while apologizing for not having acknowledged Thorndike in *The Behavior of Organisms*: ''I seem to have identified your view with the modern psychological view taken as a whole.'' Since so much of Thorndike's view became modern psychology, it was a reasonable confusion.

[The following quotation from Tolman (1938) was on a separate manuscript page; it is reasonable to guess that if Cumming had used it in his review it would have appeared about here:

> The psychology of animal learning—not to mention that of child learning—has been and still is primarily a matter of agreeing or disagreeing with Thorndike, or trying in minor ways to improve upon him. Gestalt psychologists, conditioned-reflex psychologists, sign-gestalt psychologists—all of us here in America seem to have taken Thorndike, overtly or covertly, as our starting point.]

The title of this book is its most regrettable feature. What Robert S. Woodworth had said of Thorndike in his own autobiography was: ''His sane positivism was a very salutory influ-

Editorial note: I have lightly edited the manuscript and placed my notes or comments in brackets. Where more than one version of a passage was available in the manuscript, I included only the one that appeared to be Cumming's most recent and most edited version. Breaks separate text that appeared in different groups of manuscript pages. I omitted some material peripheral to issues of learning and behavior and some quotations from Thorndike and others that were unaccompanied by Cumming's own text. I shortened some extended quotations from Thorndike, especially where the same material is considered by other participants in this symposium. The manuscript did not include a reference section, and I was not able to confirm all of Cumming's references and quotations. For example, the 1907 second edition of Thorndike's *Elements of Psychology* is easy to find but not the 1905 first edition that Cumming cites. The complete working manuscript from which these excerpts have been drawn and correspondence related to the manuscript have been deposited with the Archives of the History of American Psychology at the University of Akron.—A.C.C.

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ence for a somewhat speculative individual like myself.'' With equal justice and less misdirection, Jonçich might have entitled her volume *Freak of Nature,* citing William James's reply when Thorndike sent him a $100 check to offset what he feared was a reduction in royalties for James's *Briefer Course* caused by the publication of Thorndike's *Elements of Psychology.* ''Seriously, Thorndike, you're a freak of nature. When the first law of nature is to kill all one's rivals (especially in the school book line), you feed them with the proceeds.'' The check was returned with James's express hope that Thorndike's wife had not heard of his magnanimity ''for she *ought* never to forgive you.''

Freak of nature or eighth wonder, Thorndike was clearly a phenomenon of energy unequaled in prenuclear times. When the *Teachers College Record* compiled his bibliography at the time of his death, the list stood at 507 publications (about 50 of them books), but the returns on titles in press were still coming in. In judging this prodigious publication rate, one must remember, as Jonçich notes, that Thorndike slowed down after his retirement in 1940, reducing his mean number of publications per year to about seven through the next decade.

It is more than 70 [now 100] years since the first embryonic form of the law of effect emerged from the smelly and unventilated attic of Schermerhorn Hall. The publication of a biography of Edward Lee Thorndike seems an appropriate occasion for a review of the circumstances surrounding the birth of that profoundly important concept and the controversies which gave it meaning in its early development.

It is often worthwhile to examine the history of a concept in some detail, for it is only in historical perspective that we can see why a law took a particular form, how it was shaped by the intellectual forces present during its development and the reasons for the salience of particular aspects of the data being emphasized at the expense of others. The law of effect is no exception.

> That Thorndike comes to the Schermerhorn attic with intellectual baggage is clear. That he also comes with preconceptions of what empirical tests would reveal is as proper as it is inevitable: it is always man who frames the questions asked of nature, and the questions asked inevitably depend on prior theoretical considerations. (Jonçich, 1968, p. 143)

It is perhaps unfortunate that the 1898 dissertation *Animal Intelligence* is often unread today and in its place the more readily available book by the same name (1911) is often read and assigned to students. The issues in 1911 were not the issues of 1898. The law of effect appears clearly described by 1911 but was only hinted at in 1898, for the great central thesis which was buttressed by data in the dissertation was the inadequacy of classical associationism. Ideas were not associated, but rather an ''impulse'' (read ''response'') was associated with a situation. Associationism would never be the same again and the way would be prepared for the law of effect, which would develop in Thorndike's thinking through the following decade.

It is surprising today to rediscover just how much is in Thorndike's dissertation of 1898. There are the first vague gropings toward the concept of the operant. The dissertation attacked the notion that what was learned was an association of ideas. It had been the position of C. Lloyd Morgan that the *idea* of the act was associated with the idea of a previous pleasant experience. It was this doctrine that Thorndike attacked with vigor. The central principle of the dissertation, if indeed there can be said to have been a central principle, was placed in italics: ''*No cat can form an association leading to an act unless there is included in the association an impulse of its own which leads to the act.*'' In the language of modern theory: The response must be emitted before it can be reinforced.

''The association evidently concerned what it had *done*, what it had an impulse for, . . . not what it remembered, had a representation of.'' This is the great message of the doctoral research. Animals do not learn by imitation or by being shown how to make the response. They make the response by their own impulse.

To be sure, the law of effect in its early primitive form is there. Not stressed greatly, but there:

> The cat does not look over the situation, much

> less *think* it over and then decide what to do. It bursts out at once into the activities which instinct and experience have settled on as suitable reactions to the situation "*confinement when hungry with food outside.*" It does not ever in the course of its successes realize that such an act brings food and therefore decide to do it and thenceforth do it immediately from *decision* instead of from impulse. The one impulse, out of many accidental ones, which leads to pleasure, becomes strengthened and stamped in thereby, and more and more firmly associated with the sense-impression of that box's interior. Futile impulses are gradually stamped out. The gradual slope of the time-curve, then, shows the absence of reasoning. They represent the wearing smooth of a path in the brain, not the decisions of a rational consciousness.

Thorndike's dissertation struck boldly at the associationistic doctrines of George John Romanes [1892] and Conway Lloyd Morgan [1894]. There is an unfortunate tendency to regard Morgan as an early kind of behaviorist because of his "canon," which is avidly taught to introductory students and has even begun to distort our history books. In fact, Morgan held that animals learn by associating *ideas*. "The kitten has an impression of the ball with which it is playing, and the hungry dog may have an idea of a nice meaty bone," he says at one point (Morgan, 1894). "It would not be difficult to fill several pages with examples of association in animals but it is better to leave the reader to draw upon his own experience for supplementary cases. . . . Of course it is only when the idea suggested through association expresses itself in action that we can obtain evidence of its existence." It is true that Morgan stopped short of Romanes' conclusion that animals could "reason" (he did not deny it but simply felt that there was insufficient evidence).

Thorndike's use of the word "impulse" in this early writing is curious and no doubt is a vestigial intellectual remnant of his immersion in the thought of William James. *Impulse* is the conscious act.

> The word *impulse* is used against the writer's will, but there is no better. Its meaning will probably become clear as the reader finds it in actual use, but to avoid misconception at any time I will state now that impulse means the consciousness accompanying a muscular innervation *apart* from *that feeling of the act which comes from seeing oneself move, from feeling one's body in a different position, etc.* It is the *direct feeling of doing* as distinguished from the *idea of the act done* gained through the eye, etc. For this reason I say "impulse *and* act" instead of simply "act." Above all, it must be borne in mind that that by impulse I never mean the *motive* to the act. . . . Anyone who thinks that the act ought not to be thus subdivided into impulse and deed may feel free to use the word *act* for *impulse* or *impulse and act* throughout, if he will remember that the act in this aspect of being felt as to be done is in animals the important thing. (Thorndike, 1898, pp. 14–15)

While this distinction may seem odd to the modern reader, the reason for it is clear in the dissertation. Manual manipulation of the cat's paw so as to "demonstrate" the release mechanism of the puzzle box is insufficient to produce learning. This is the act stripped of its impulse. Similarly, the *act* can be observed in others (as in imitation) but no learning occurs for the impulse is not observed.

Out of the welter of mentalistic concepts Thorndike was struggling to put into words an embryonic notion of response emission. "The response must first be emitted to be reinforced" we glibly tell our introductory students, forgetting how much excess verbal baggage had to be dropped before this streamlined version could be emitted. Thorndike, like his cats, learned quickly which of his own responses were crucial, and by the time of the publication of *The Human Nature Club* in 1901 it is clear that he regards the word *act* as alone sufficient to convey his meaning.

The important thing to be noted in this intellectual history is that the concept of spontaneous emission had to precede the concept of effect. How does the response get there in the first place? Thorndike seems impatient with the question as of little pragmatic consequence. "Instinct," he says, and adds just to make sure that the reader understands that this is a shorthand for ignorance, "Anyone who objects to the word may substitute 'hocus-pocus' for it whenever it occurs. The definition here made will not be used to prove or disprove any theory, but simply as a signal for the reader to imagine a certain sort

of fact.'' What sort of fact? That a response has occurred—''Any reaction to totally new phenomena.''

[The following, based on Herrnstein (1967), appeared in the first paragraph of an early draft of the review, just before the reference to Boring] ''Why, then,'' asks Herrnstein in his introduction to Watson's *Behaviorism*, ''do we call Watson a behaviorist, and not Thorndike?'' The answer to this rhetorical question is supplied in terms of the priority of Thorndike's eminence (''that virtually prohibited him from changing his affiliations'') and in Watson's refusal to deal with the law of effect.

[The next paragraph, from a handwritten page of the manuscript, quotes the 1905 statement of the law of effect cited elsewhere in this symposium; the brackets below are Cumming's] Postman (1947) cites Thorndike's 1911 book *Animal Intelligence* as the earliest statement of the law of effect. Actually, a law going by the name ''effect'' had been stated as early as 1905 in Thorndike's *Elements of Psychology*:

> Connections between neurones are strengthened every time they are used with indifferent or pleasurable results and weakened every time they are used with resultant discomfort. The line of least resistance [to the transmission of a nervous impulse] is, other things being equal, that resulting in the greatest satisfaction to the animal.

A law sounding somewhat closer to the later law of effect was also promulgated at that time and called the *law of habit formation*: ''Any act which in a given situation produces satisfaction becomes associated with that situation, so that when the situation recurs the act is more likely to recur.''

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